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RECENT EXPLORATION IN THE WESTERN SAHARA

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Late accounts of travels in the Sahara remind us forcibly that this vast area, half as large as Europe, is, in large part, a veritable *terra incognita*. The traveler finds little of aid in the way of accurate or detailed maps, or descriptions of the topography, the animals or plants, or even of the manners of the various desert peoples which he will meet. The absence of these things, together with the inherent unfriendliness of the great desert, makes all travel across it an undertaking not to be held lightly. True on routes best known, it is especially true away from these routes, where often even the native tribes have never been, and where travel is exploration in fact.

The reason why the Sahara is as a whole so little known lies, as is well understood, in the fact that great obstacles are placed in the way of its exploration. These do not consist in the inhospitable climate only, but, among other things, in unfriendly tribes, fortunately growing fewer year by year, which are hardy peoples, living largely by preying on caravans. The leading factor which makes exploration of the desert at all possible is the camel, the "ship of the desert" in a very real sense, which can travel a week, or more, without water and food, making possible exploration where water can be obtained every 200 miles, more or less. But to-day even with the camel, and with guides, and with the protection afforded by the French, the trip across the Sahara, nearly 1,600 miles from Biskra to Timbuktu, is a *tour de force* requiring not alone much

physical endurance but the indefinable natural ability to meet and overcome whatever hindrances may fall in the path of a pioneer.

As a rule, caravans which cross the desert are for purposes quite

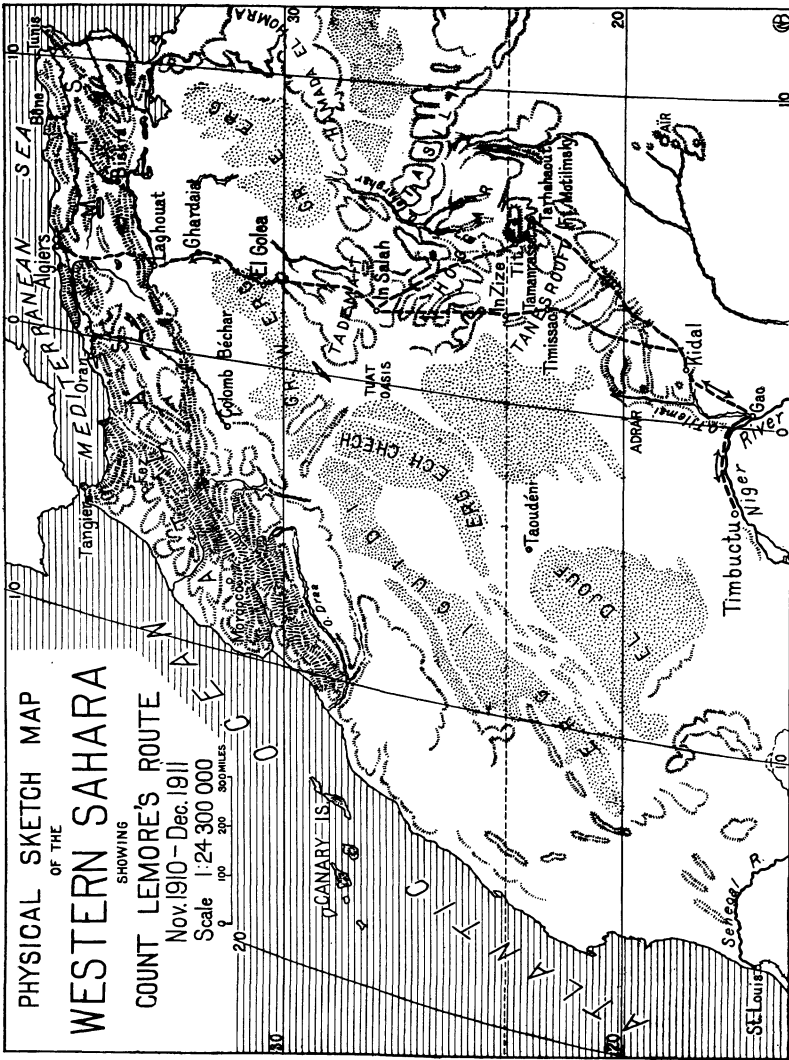


FIG. 1.
(N. B.—In the title, "Lemoire" should read "Le More." On the map, for "Ft. Motylinski" read "Ft. Motylinski.")

other than that of studying the country and its ways and such record as they may leave, of a consequence, do not give a satisfactory account of much we should like to know. Such observations as are given, however, when added to what has been done before,

are useful in gradually building up our knowledge of the great desert. Such a book is that by Count René Le More¹, a young Frenchman, who recently crossed the western Sahara twice, from Algiers to Timbuktu and return. On the way south Le More followed known paths, but on his return for a part of the route he covered territory previously untraveled. While largely a personal narrative, the book contains not a little that is of general interest and importance, especially to the French who will conquer the Sahara, if ever it is conquered, by the use of air craft. When the aeroplane branch of the French army, whose headquarters on the desert are at present at Biskra, is adequately developed, there appears to be no reason why the physiography and the natural history

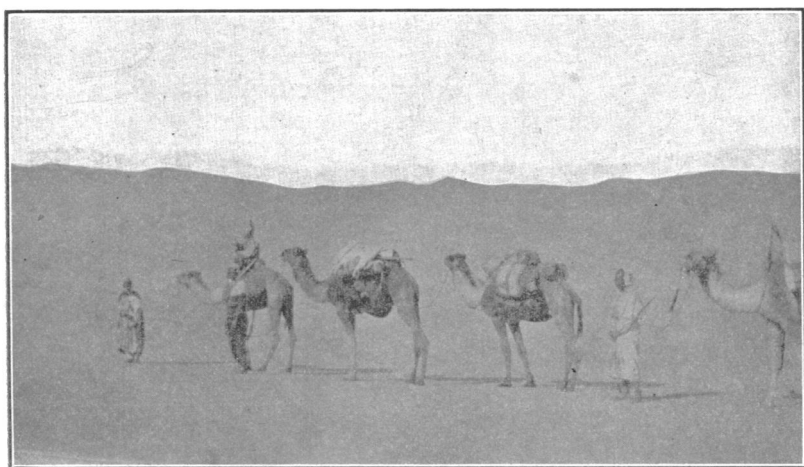


FIG. 2—Le More's caravan en route.

of this vast area should not be fairly well known. In addition, the marauding tribes which are even now a real menace to every crossing caravan, should by means of air scouts be better held in check and finally compelled to adopt a more acceptable means of winning a livelihood. It is with such ideas in mind that Le More undertook his long journey occupying thirteen months from Algiers, of which ten months were taken up in actual travel.

Le More began the journey at Ghardaia, the ancient capital of the M'Zabites and six days by *diligence* from Algiers. Ghardaia is in the midst of the northern edge of the Sahara and thus is

¹ D'Algier à Tombouctou: Des Rives de la Loire aux Rives du Niger. Plon-Nourrit et Cie., Paris, 1913.

surrounded by typical desert. Much of the activities of the dwellers there is characteristic of life in the larger oases. Here one finds strange oriental scenes, manners, and customs. There are large palm gardens and diminutive barley fields, where water is conserved to the utmost, and, chiefly, interesting markets in which one sees the products of the coast placed side by side with those of the far south. Here is wheat from the Tell, salt from the Oued Rhir, ostrich eggs and plumes from south of the Tanesruft desert, and dates from other oases, especially from Wargla. The small brown camel of Algeria and the large white Tuareg camel from the interior are seen and heard in all parts of the market square. Trading is carried on with great earnestness by the *bournoused* Arabs, and the hum of their conversation added to the groanings of the camels, the oriental dress, the scent of cookery and of incense, make up an *ensemble* of extreme picturesqueness.

The Ghardaia region is probably typical of much of the western Sahara. Here are plains on which lie low and flat-topped mountains. The plains are covered with stones, or pebbles, blackened "by fire from heaven", the Arabs say. At intervals one sees *oueds*, similar to the arroyos of the southwestern United States, which are usually dry but which at rare intervals are filled with a rushing torrent. Along the *oueds* there are flood plains often of considerable width, as at Ghardaia. Finally, dunes occur here and there by the Oued M'Zab. We thus have several physiographic formations which have received distinctive names at the hands of the Arabs. The fluvial deposits, possibly alluvial also, form the *reg* desert; the sand is the *areg*; the pebbly plain is the *hamada*. There are no *chotts*, or salt spots, of importance in the vicinity of Ghardaia. Of these distinct formations the *areg* and the *hamada* are the most intense deserts, usually supporting scant vegetation, if any. The part of the *chotts* most heavily charged with salts is also devoid of plant life, but the margins of the *chotts* bear characteristic halophytes. But, in the western Sahara, so far as is known, the *reg* is rarely, if ever, quite devoid of plant life. Some characteristics of the physiographic formations mentioned, as well as of the plants which are to be found on them, and of the Ghardaia-Wargla region, have already been given in the *Bulletin*², to which the reader is referred. In following Le More across the Sahara it will be seen that much of the country traversed by him is *hamada*, or mountainous, and that relatively little is *areg*. *Oueds* and their

² W. A. Cannon: Some Features of the Physiography and Vegetation of the Algerian Sahara, *Bull. Amer. Geogr. Soc.*, Vol. 45, 1913, pp. 481-489.

flood plains, *reg* desert, were followed for great distances, partly because of food for camels, and partly because dug wells occur only in connection with *oueds* or the *reg* desert.

LE MORE'S JOURNEY: GHARDAIA TO TIMBUKTU AND RETURN,
NOVEMBER, 1910, TO DECEMBER, 1911

It chanced that the writer of this sketch was in Ghardaia at the time Count Le More departed on his long journey.³ Although apparently well considered, the outfit seemed to the observer extremely meager for so great an undertaking. There were two servants, of whom one was cook and guide and the other the cameleer, two baggage camels, small beasts from the northern part of the desert, and one fine white riding camel (Fig. 2). The latter animal, a *mehari*, was a Tuareg camel probably from the Adrar region south of the Tanesruft desert. Of this outfit, both Arabs went to the journey's end and returned with the traveler, and the *mehari* came back as far as In Salah. Baggage camels were hired or purchased from time to time as required. Although the personal outfit of Le More was not increased beyond that above given, there were added to his caravan from time to time, as is the custom of the desert, various individuals and small caravans, joining forces for mutual protection against highwaymen, or for companionship. For much of the trip, however, his party traveled separately.

By the route followed two important oases were seen, El Golea and In Salah, and two French posts, Ft. Motylinski and Kidal. The position of these are indicated on the accompanying map (Fig. 1). Between these widely separated places there were seen a few Arab villages, but, for the most part, the wells visited were in the open desert and were used by nomads or caravans only, and were not the sites of the villages. Only one European—and he was a soldier on special duty—was encountered *en route*.

The first leg of the journey, requiring eight days' march, ended at El Golea, about lat. $31\frac{1}{2}^{\circ}$. Every 30 or 40 kilometers *bordjes* were met, which are fortified water stations, and the passage was accomplished with little incident. Along the *oueds* there was found sufficient pasturage for the animals.

El Golea is a prosperous oasis with an abundance of water.

³ As Le More had no camera, the writer persuaded him to take one of his kodaks with him. Le More did so and had remarkably good success when it is considered that he had no prior experience in photography. The accompanying views were made by him with this instrument. As Le More's book is not illustrated, these are the first pictures of his trip to be published. Their value is enhanced by the fact that views of the Central Sahara, especially away from the army posts, such as those of the Hoggar and the Tanesruft (Figs. 6-8 and 12-13), are not frequent.

Here are raised grains, vegetables and fruits; of the latter, the date is the most important. At El Golea, also, the French have established a post and maintain a small garrison.

Between El Golea and In Salah, about lat. 27°,—a journey which required 13 days of travel—the country is somewhat mountainous and probably the altitude somewhat higher than at El Golea. In the *oueds*, which wind about among the mountains, there is to be found a fairly dense growth of small herbaceous plants and shrubs, providing abundant food for the camels (Fig. 3). In addition to mountain topography, there are wide stretching plains, *hamada*, which, as is usual with this formation, is almost wholly barren (Fig. 4).



FIG. 3.—In camp between El Golea and In Salah.

In Salah is an important oasis in many regards. It is on several main caravan routes, as, for instance, from Morocco to Tripoli and from southern Algeria to the Niger, and before the French occupation it was an active slave mart. At the oasis there is an army post,—the only important one in the Sahara (Fig. 5). The position of In Salah can be best appreciated, perhaps, when it is stated that by the present usual means of travel it would require one month to go from the oasis to Algiers, and, yet it is only on the threshold of the great desert!

Between In Salah, which is in the Tuat region, and the Niger by the route taken by Le More, there are about four great physiographic areas, namely, the mountainous region of the Hoggar (Figs. 6, 7 and 8), the Tanesruft desert, the Adrar mountains, and the

Tilemsi drainage area. The Tanesruft is the most intense desert of the western Sahara and lies in about lat. 22°. The two mountainous regions, Hoggar and Adrar, lie to the north and to the south of the Tanesruft. The Tilemsi River, practically a large *oued*, runs from the Adrar region to the Niger. After leaving In Salah, Le More's objective point was Ft. Motylinski in the Hoggar, a march of 29 days.

Beyond In Salah all caravans crossing to Timbuktu must be completely outfitted, and, also, they must be able to defend themselves against attack, as there is little law or order beyond the sound of French guns.

Le More's caravan was increased by two soldiers returning to

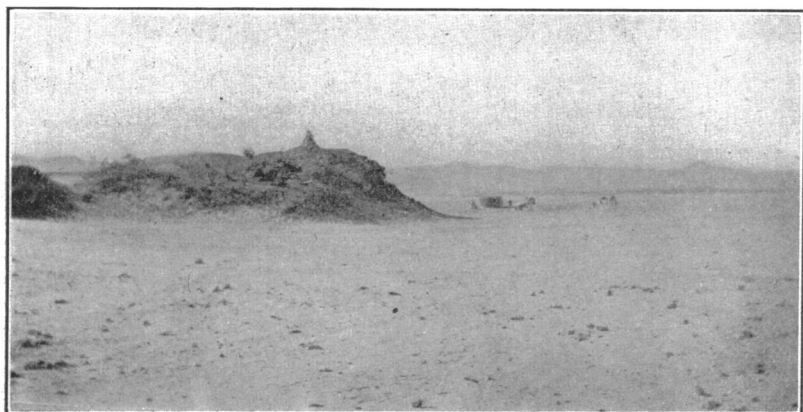


FIG. 4.—View on the *hamada* between El Golea and In Salah.

Ft. Motylinski, so that the little company mustered eight guns all told. The departure from In Salah was made on December 3. The season was most pleasant for desert travel. The daily temperatures ranged from 30° C. in midday to -3° C. at night, which is a range of about 60° Fahrenheit. Between In Salah and the Hoggar lies a desolate plateau, where for 80 miles or more, there are no wells,⁴ and here, apparently *hamada*, there appears to be no vegetation whatever. In the *oueds*, however, shrubs are to be found. As the Hoggar is approached and reached the vegetation increases, until it is not inconsiderable⁵. The mountains attain an altitude of 6,000 feet or more.

⁴ A. H. W. Haywood: Through Timbuctu and Across the Great Sahara. Lippincott, Philadelphia, 1912 [for review, see *Bull.*, Vol. 45, 1913, p. 57. Ed.].

⁵ M. Chudeau collected 155 species of plants in the Hoggar, according to Battandier and Trabut, *Bull. Soc. Bot. de France*, Vol. 53, 1906.

On Christmas day Le More met the only European encountered *en route*. This was in the Hoggar. The man was a French sergeant in charge of a well-digging and cleaning squad of Arabs. The "puisatier" had been in the field three months without seeing a European. The meeting was a happy one to both parties! Thanks to the work of these men, water could be procured at least every three or four days in the Hoggar. About one hundred years ago, during a war between the Chambas of the northern Sahara and the Tuaregs, many of the ancient wells were filled, or otherwise destroyed. In this manner an impassable barrier was created,—a neutral zone which enforced peace. The wells are from 10 to 20 meters deep in the Hoggar and the water is usually good.

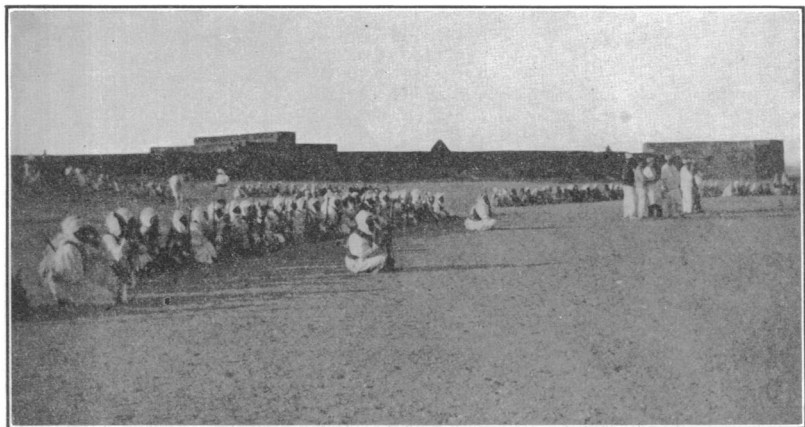


FIG. 5.—Company of desert police, *méharistes*, watching artillery practice at In Salah.

Two small towns were seen in the Hoggar which are of a certain interest for different reasons. The first of these, Tit, is situated on a wide plain with mountains rising north of it to a height of 2,400 feet or more. The place is famous in desert warfare as the scene of a fierce battle waged between a few French and many Tuaregs, in which victory went to the French, and with it passed the control of the western Sahara. This was in 1903, since which time only isolated and unorganized bands of highwaymen, serious enough, to be sure, are to be encountered in the desert.

Not long after leaving Tit the village of Tamanrasset was seen. Tamanrasset is situated in a vast gravelly plain (*hamada* ?), which, however, is not so arid as this formation is usually (Fig. 9). Large tufts of shrubs or half-shrubs are scattered over its surface. At

the village live two men of importance—for very divergent reasons. Of these, one is Père de Foucault, otherwise known as the hermit of the Sahara. He is providence to all unfortunates, and is adored by Chambas, Tuaregs and the French alike. Formerly a French officer, Vicomte de Foucault, he joined the White Fathers, explored very largely the western Sahara, when, at times, he assumed great personal risk. It is said that at present he is engaged in compiling a Tuareg dictionary. Near Père de Foucault lives Moussa Agamastane, grand chief of the Hoggars, really sheik, who was formerly the active enemy of France, but who now as actively

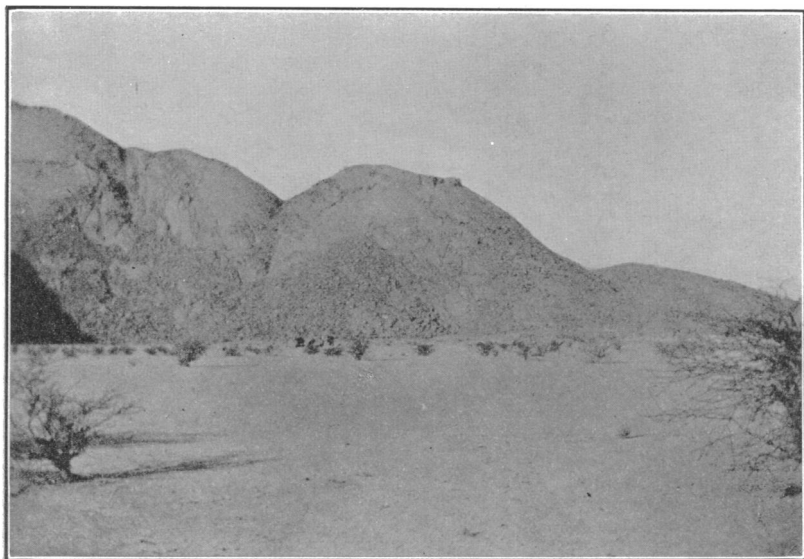


FIG. 6—View in the northern Hoggar region. Scene of Le More's meeting with the "puisatier."

supports the French (Fig. 10). Through the aid of Moussa companies of camel police, *méharistes*, have been organized to patrol this portion of the desert. He assisted, also, in the construction of Ft. Motylinski, on the southern edge of the Hoggar, where a post was built in 1909. The leading industry of the dwellers at Taman-rasset is the raising of camels, although the center of this industry is in the Adrar region, south of the Tanesruft.

In commenting on some customs of the Hoggar, Le More says that the women of the region have a very different standing from the women of the Sahara farther north. They are not veiled; in this they are like the lower caste Arabs, and they enjoy other wide liber-

ties. Property and the family name appear to descend through the female line. Much of the personal freedom, however, is lost on marriage. Monogamy usually obtains, although the chiefs may have more than one wife.

Immediately after leaving Tamanrasset the route passes through mountains, some of which are 6,000 feet high or more and are the highest in the region. The French post, Ft. Motylinski, in the southern Hoggar, was reached the first week in January, and a well earned rest of ten days was enjoyed.

At Motylinski, where at the time ten French soldiers were sta-

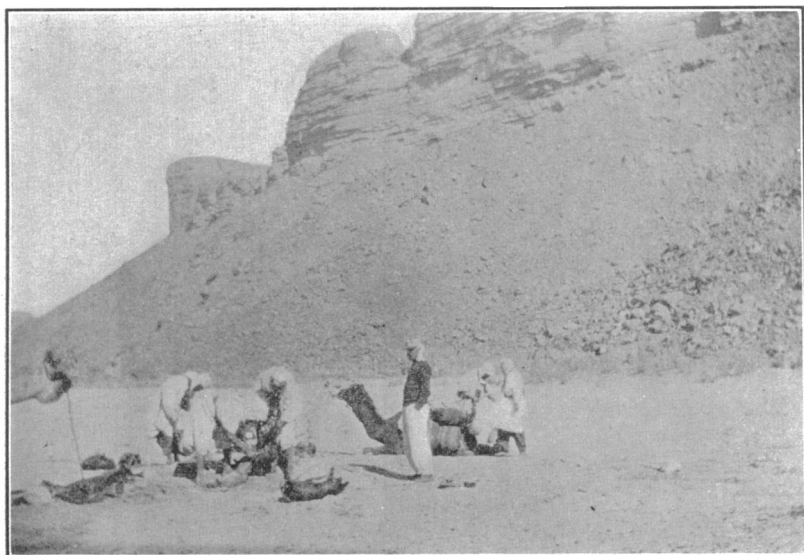


FIG. 7.—Gorge of Takumbaret, northern Hoggar region, three weeks from In Salah. The gorge is about 50 kilometers long and is usually less than 100 meters wide. It supports a shrubby vegetation, which, however, is rather sparse.

tioned and about a company of native troops under their command, the first definite news of highwaymen was received. Soon after Le More's arrival at the post an officer and his men returned from chasing a band of robbers who had plundered a caravan between there and Kidal. The robbers had killed several men and taken many camels. At the post Moussa Agamastane was seen and interviewed. The famous native chief understood only Tuareg, his secretary only Tuareg and Arabic. Le More talked only French, and his servant only French and Arabic. Although conversation under the circumstances dragged somewhat, Moussa was found to

be a very interesting man. His views on Paris, where he had been once taken by the French, and of French customs were very amusing.

Motyliniski was left on January 15 and Kidal, beyond the Tanesruft was reached in 30 days. South of Motyliniski the mountains became less high, the streams are fairly numerous, and irrigation is practiced to a certain extent by the Hoggars. Vegetation, especially along the *oueds*, is relatively abundant and the plants are of good size (Fig. 11).

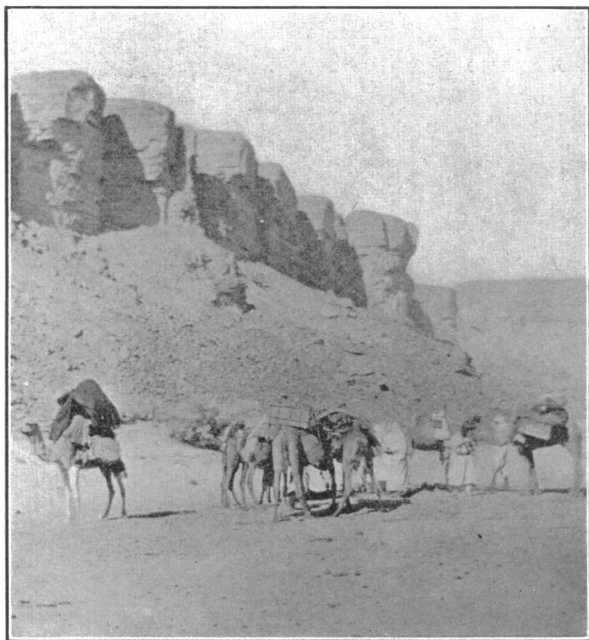


FIG. 8—View in the Hoggar region.

About two days after leaving Motyliniski, le More reached a small Hoggar village, Tidjenoem, where he was well received and where he noted some interesting customs. The leading men brought him milk and eggs,—the latter being rare in the Hoggar. Domestic poultry holds a peculiar position amongst the villagers. They are a heterodox Moslem sect although, at present, there remain but slight traces of the deflection, and this is to be found in the attitude of the people towards poultry. Among the sect the cock is taken to represent the muezzin in announcing the seasons for prayer! As a result chanticleer, as well as his female relatives

and friends, enjoy great prestige. So much is this the case that poultry, or even eggs, are eaten only in case of real need. Therefore, the gift of eggs had, in the minds of the donors at any rate, not a little significance.

Upon leaving the mountainous Hoggar the country becomes more and more desolate. The tufts of herbaceous plants and of shrubs become less frequent and more stunted. Finally all plants appear to be left behind and a truly desertic zone is entered—the Tanesruft—which required 5 days to cross. The Tanesruft is perhaps the most extensive region without water in the western Sahara. It is part of an arid belt which stretches from the Lake Chad region westward to near the ocean. There appears, from the ac-

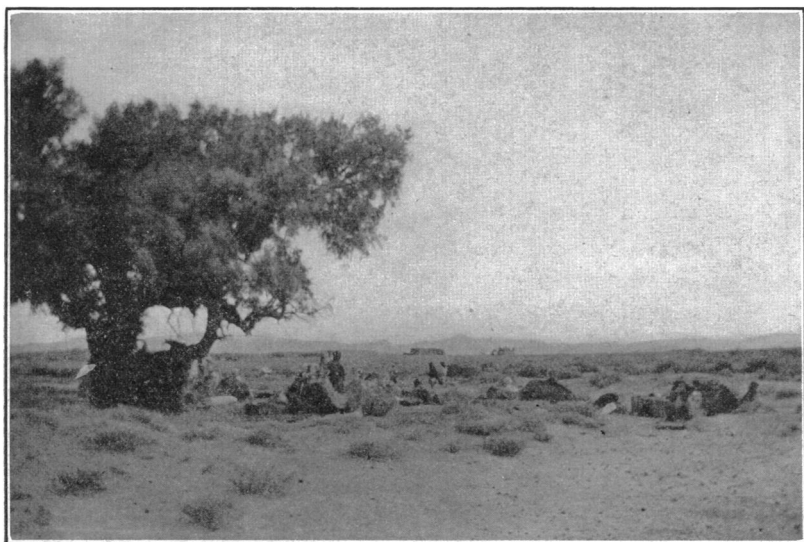


FIG. 9.—General view on the plain at Tamanrasset.

counts left by some travelers across it, not a little variation in the topography of the belt. Somewhat to the east, the surface is a “sea of rocks”,⁶ and to the west “a monotonous stretch of sandy plain”.⁷ Where Le More crossed the Tanesruft it is described as being a level and sandy plain, where the sand storms may at times be very severe. The area, noticeably more arid than the surrounding portions of the Sahara, although thus extremely desertic in character, supports, nevertheless, some vegetation (Fig. 12). This, however, is extremely meager. It is true desert in all of its horror,—not a

⁶ F. Foureau: *D'Alger au Congo par le Tchad*. Masson, Paris, 1902.

⁷ A. H. W. Haywood: *op. cit.*

bird, not a sound, not even traces of the gazelle which is abundant in other parts of the great desert (Fig. 13). Although at present thus desolate, the region gives indication of having been inhabited at a remote time. This is evidenced by the presence of prehistoric tombs. Around these tombs the Tuaregs have gathered curious superstitions, believing them the dwelling places of spirits. Le More says that when the women of a tribe are without news of overdue caravans, one of them clothes herself in her best garments, and, leaving everything metallic behind, lies near one of the tombs and believes that in answer to her prayers the mysterious host appears. He has, she says, eyes like those of the camel, and he reveals to her the fate of the absent ones.

Finally after having gone nearly 200 miles without water, five days' march, herbage again appears. Tufts of shrubs are seen

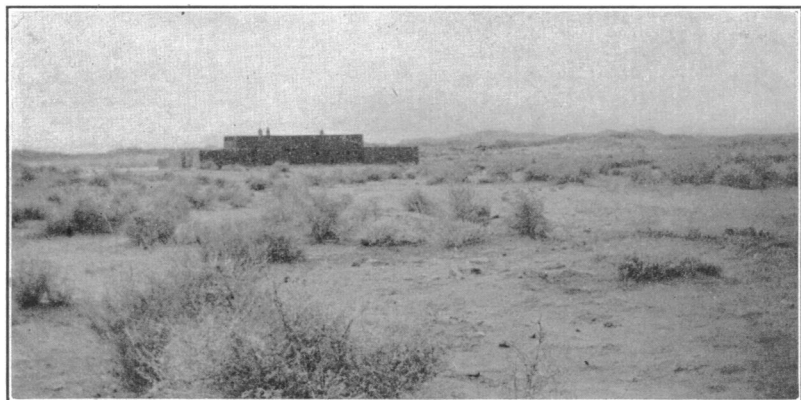


FIG. 10—House of Moussa Agamastane, chief of the Hoggars, at Tamanrasset.

and groups of trees curiously perched on buttes a few meters high. On the southern edge of the Tanesruft, also, there are rocks of fantastic shape, eroded by sand through wind action, which for several kilometers give a bizarre aspect to the landscape (Fig. 14). Leaving this region the Adrar is entered,—a mountainous country where the valleys are wide and the mountains are not as high as in the Hoggar. Vegetation is more abundant in the Adrar, and also, there is much game.

The Adrar had hardly been reached when signs of the presence of desert robbers were met, and Tuaregs were seen who had been attacked by them. The Adrar is especially subject to the ravages of highwaymen who come across the desert from Morocco, renew their stock of camels in this, the center of the camel raising industry,

and drive off other domestic animals. Le More's party, however, were extremely vigilant and escaped the notice of the robbers.

The Adrar ending sharply, the travelers emerged in a large valley, that of the Tilemsi, in which lies the road leading to Kidal, and ultimately to Gao and the Niger. The Tilemsi, thought to be the bed of an abandoned immense northward bend of the Niger, supports to-day much vegetation, and, in times past, the valley was probably well populated. At present, however, owing to the incessant raids of robbers, it is almost a desert.

Kidal was reached on February 15. This French post, like the one at Motylinski, has been recently established. It is an ancient

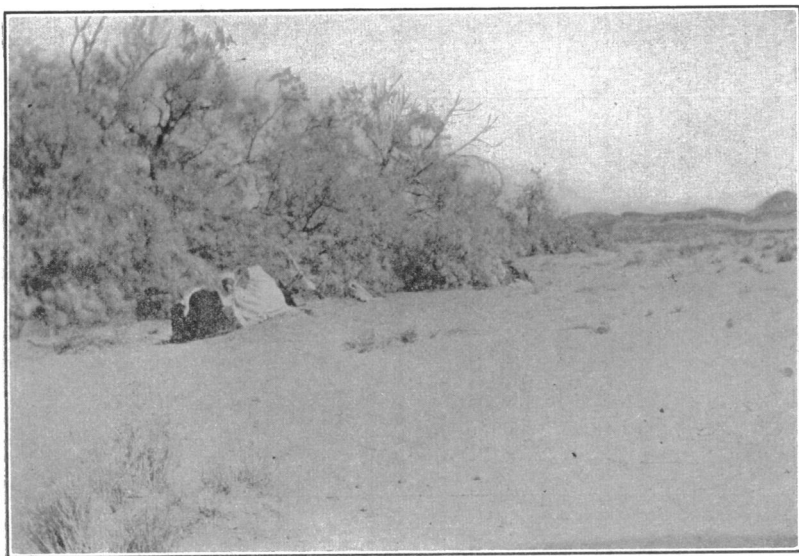


FIG. 11—View in a *oued*, to the south of Ft. Motylinski, southern Hoggar region.

village, possibly formerly inhabited by negroes; to-day the huts of natives, Tuaregs, surround the post.

From Kidal to the Niger, the country is only semi-desert. Here the valleys, especially the Tilemsi, harbor much vegetation, including trees, and the vegetation increases in amount, and in size, as the Niger is approached. A curious condition was observed in the Tilemsi valley where there were zones of dead trees alternating with zones of the living. The killing may have been due to excessive drought, since Hayward, in describing the same phenomenon, remarks that no rain had fallen for five years.

Gao, on the Niger, was reached on February 25, and Timbuktu

on March 15, and the first half of the long and difficult journey was over.

Le More remained in Timbuktu until mid-July, during which time he made plans for the return over the desert, and recuperated from the long journey just completed.

On the route back to Algiers it was proposed to go over a portion of the desert hitherto little known to Europeans, and, possibly, never traversed by them. It was Le More's plan to return farther west than the southward journey, and to reach southern Algeria and the railroad at Colomb Béchar, on the Morocco-Algeria boundary. The route would be by Taudeni. The advantage of this route as a track for future caravans to follow, or for an aeroplane route, are mainly two, namely, it is the shortest way from the Niger to the

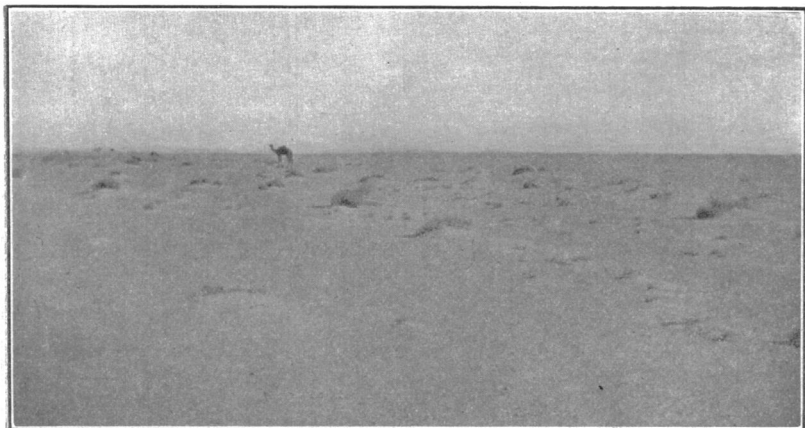


FIG. 12—General view in the Tanesruft desert.

southern terminus of the railroad, and it possibly includes the greatest number of oases. The disadvantages, as felt at the moment, lie wholly in the large numbers of robbers who frequent a portion of the route. Le More soon became aware of the real strength of the robbers. In attempting to engage men and guides for his return, he found great difficulty. All of the leading natives, merchants, *marabouts*, and chiefs of tribes counseled against the plan, and were very plainly either in direct league with the robbers, their secret agents, or feared offending them. It was only after much effort that a guide was secured and all arrangements made to return by the desired way. Upon reaching Gao, however, Le More was informed by the army that the robbers had been very troublesome of late and that he would not be permitted to return over the

route as planned. When the necessity of a change in plans became apparent, Le More, with the counsel of the French officers, decided to retrace his route to Kidal, but from there to In Salah to go direct and by a route not previously taken by Europeans. This way, as the accompanying map shows, lies to the west of the southward passage, and is much shorter. From In Salah northward the same route would be taken as was taken, when south bound.

Leaving Gao on August 18, Kidal was reached on September 25. The first part of the return was made more difficult by reason of fever which Le More and his men suffered and by the summer heat.

Summer is the season of rain in the southern Sahara, so that the Tilemsi valley had a luxuriant vegetation. The annuals were

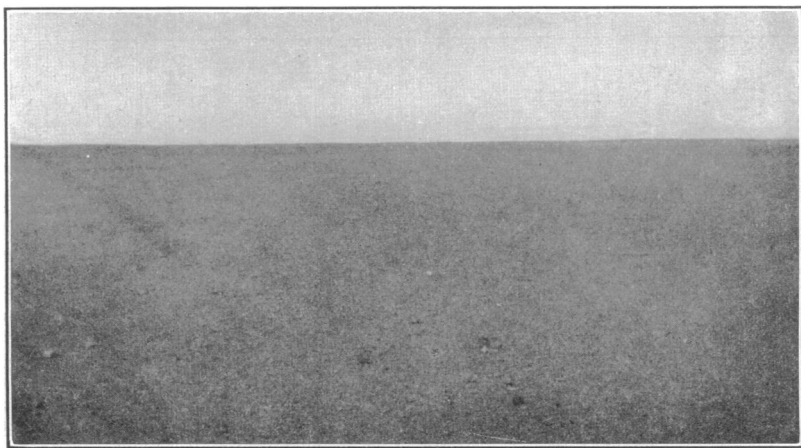


FIG. 18—General view in the Tanezruft desert.

abundant and attained a height of 30 to 40 centimeters. Such fertile zones were crossed by sterile ones, in which the summer vegetation was lacking. One day a prairie thickly covered with green vegetation was crossed, the next day a dusty and barren zone was encountered, to which there succeeded an open forest of spinose species (*Acacia* ?), which appeared in the distance green and in flower. No explanation was offered for this peculiar variation in the vegetation.

At Kidal there were rumors, soon confirmed, of robbers in the Tilemsi region. Tuaregs, loyal to the French, had been driven from their pastures by the brigands, and traces of these freebooters were to be seen everywhere. On this account Le More's little party had to be extraordinary careful, parking their beasts near camp,

remaining away, as much as possible, from wells, and maintaining constant watch.

One of the most common customs of the desert may be shown by an incident which took place not long after Le More left Kidal. A party of Tuaregs was encountered who had the intention of driving a band of sheep and camels to In Salah for sale. They had about given up the project because of danger to themselves and their charge when Le More was seen. Asking to be allowed to join his caravan, they agreed not to hinder his march in any way, and would aid whatever way possible. Thus, Le More became the *de facto* chief of a desert band, and distributing arms and ammunition among them, felt more secure against the robbers. The Tuaregs

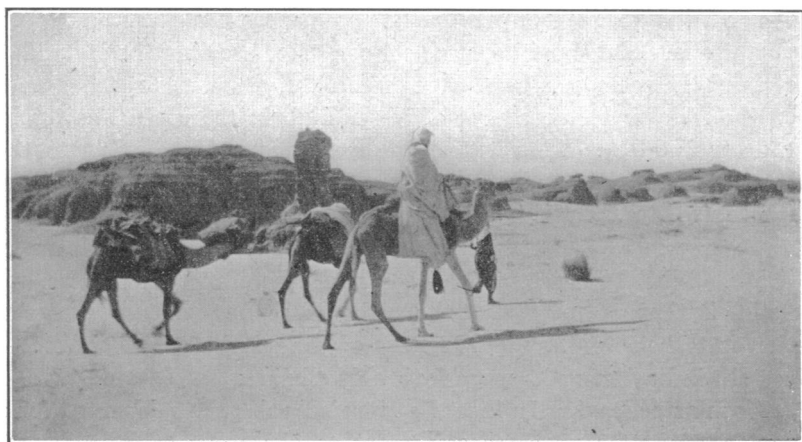


FIG. 14—Effects of sand erosion between the Tanesruft and Kidal.

had about 400 sheep and 50 camels in their band, and it is interesting to note that, despite the very great hardships met in traversing the Tanesruft and the usual shortage both in food and in water, only about 25 of the sheep succumbed before arriving at their destination. On the Niger the sheep are worth about 2 francs, in the region south of Kidal they bring 4-5 francs, north of Kidal their value increases to 7-8 francs, and at In Salah they are worth 12-15 francs each.

Leaving the valley of the Tilemsi, after having traveled in it 13 days from Kidal, a small mountain range, parallel to the valley, was crossed and a wide valley entered. The latter became more and more desertic in character and led to the Tanesruft. In the rocky valley, whose floor is of sand and without vegetation, there are excellent wells, the last before entering on the dreaded Tanesruft. The

place of the wells is called Timissao. There are no dwellers at the wells.

Upon leaving Timissao the Tanesruft was entered and, after four days' forced marching, was crossed. At the place of crossing the desert was of sand, flat, and there were pronounced mirage effects. Apparently wholly barren, there were found occasionally broom-like shrubs which were eaten to the roots by the camels. On the third day a sandy barrier, running east and west, was encountered, which was 100 to 150 meters high and about as broad at the summit. Two other sand ridges of the same character were subsequently seen and crossed. These were about 40 kilometers apart. Between the two northernmost ridges Le More's party found the remains of a French officer who had been surprised and murdered by robbers a few months previously. The bones were gathered up and taken to In Salah for interment. Soon after crossing the last ridge of sand the rocky northern edge of the Tanesruft was reached and, on the following day, a pool of water high in the rocks was found (Adrar Nahlet). This water, however, was not accessible to the beasts, who had to endure another day before arriving at In Zize, where water was to be had in abundance.

In Zize is 18 days of march from Kidal and about 12 from In Salah. Like Timissao, to the south of the Tanesruft, there are no habitations of any sort at the well. Here, however, some vegetation is to be found, and the tracks of the gazelle are again met—certain indications of a more favorable climate.

Soon after leaving In Zize⁸ Le More's Arab guests departed for a region of better pastures somewhat to the west. Grave danger from attacks by the robbers were over, and the party, increased by three Tuaregs who were going to In Salah to obtain certain permissions of the government, journeyed the balance of the way to In Salah in comparative comfort. The route went through a fairly rough country, where the valleys bore a relatively rich vegetation, and the wide plains, *hamadas*, were barren. Three days before being due to arrive at In Salah Le More parted with his baggage camels and made a forced march to the post. He was impelled to do this in part from desire to have a rest from the long and tiresome journey, and in part because his provisions were nearly exhausted. During the days of forced march, about 100 kilometers per day were made. At a point 20 kilometers south of In Salah the route

⁸It is evident, from Haywood's account, that he crossed the Tanesruft from Timissao to In Zize along the route followed a few months afterward by Le More. But from In Zize their routes must have been different, since Haywood speaks of entering the Tanesruft a second time, while Le More passed through a rough country, really an extension of the Hoggar.

followed over a year before was first seen. In Salah was reached on November 8.

After resting a few days at In Salah the traveler pushed on to Ghardaia, where he arrived December 13, after having traversed about 2,400 kilometers of desert,—a fine record of endurance.

LE MORE'S DIRECT RESULTS AND CONCLUSIONS

In addition to giving descriptions of new or little traveled parts of the western Sahara, glimpses of some of the customs of dwellers in the desert, and, among other things, some account of the climate during his sojourn in Africa, Le More gives notes on the sources of water on the route between Ft. Motylinski and Kidal, and between the latter place and In Salah. He gives also his impressions concerning the feasibility of conquering the desert by aeroplane, and outlines a new and shorter caravan route between Timbuktu and Algiers.

The extreme scarcity of water is well illustrated by Le More's notes. Between Motylinski and Kidal for example, out of the 21 days required to make the passage, water was carried 17 days. And from Kidal to In Salah, a journey requiring about 44 days, water was found at 12 places only!

Crossing the desert by aeroplane is considered by the author as feasible and highly desirable. He points out that an established aeroplane service would be of great military advantage to the French, making the subduing of the robbers less difficult, and uniting the French possessions on both sides of the Sahara. Also, it would greatly facilitate the carriage of mails and despatches. In place of requiring three months, as at present, 10 days should suffice to carry mail by aeroplanes from Timbuktu to the railroads in Algeria.

Finally, Le More suggests a new caravan route to the Niger, and proposes at some future time to traverse it.⁹ This route would run from the end of the railroad at Colomb Béchar to Timbuktu by Taudeni, which is an important center for obtaining salt, and would reduce the distance between Biskra and Timbuktu from about 2,500 kilometers to about 1,800 kilometers, and would effect a proportionate saving in time. It is estimated that the passage via Colomb Béchar could be accomplished in 40 to 50 days by camel.

⁹ Since the above was written, the unwelcome news has been received that Count Le More died of fever on October, 1913, at Gaboon, in the French Congo. The young explorer, who was 26 years of age at the time of his death, was on his way to the Congo from whence he planned traveling to Lake Chad, and from Lake Chad his route was to lie across the Sahara once more to Algeria.